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MAINTAINING THE INLAND WATERWAY SYSTEM FOR AGRICULTURAL SHIPPERS

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Introduction

My name is Gerald Barnes and I am the Deputy District Engineer for Programs and Project Management for the U.S. Army Corps of Engineers at the St. Louis District. I would like to talk today about the condition of the Inland Waterway System, more specifically, the Upper Mississippi River System. As the years have gone by, it has been increasingly evident that work must be done to maintain the current system and to meet the future needs of the system.

Existing Navigation System

The existing navigation system on the Upper Mississippi River was constructed in the 1930's. This system of locks and dams, in conjunction with channel dredging, channel stabilization, and training measures has provided a dependable transportation artery for over 60 years. Maintenance activities associated with the navigation channel continue on the Upper Mississippi River.

There are 29 lock locations (33 locks) on the Upper Mississippi River and 8 locks on the Illinois Waterway. The locks are primarily 600-foot, with 1200-foot locks at locks and dams 19, Melvin Price, and 27. The Upper Mississippi River moved 124 million tons of commodities in 1995. The Illinois Waterway moved 47 million tons of commodities in the same year.

The existing navigation project provides for obtaining and maintaining a minimum channel depth of not less than 9 feet and a minimum channel width of not less than 300 feet at low water, with additional widths in bends.

Waterborne Commerce Statistics for 1997 give you an idea of the commercial navigation volume at the most downstream lock and dam on the Upper Mississippi and Illinois River. There were 2,694 tows which moved through lock and dam 25 located at near Winfield, Missouri. This amounted to 34 million tons of commodities with an estimated value of \$4.0 billion. There were 3,123 tows that moved through the La Grange lock and dam in Illinois. This amounted to approximately 35 million tons of commodities with an estimated value of \$4.2 billion.

As an example, to move the 3,123 tows at La Grange:

Almost 31,400 barges were required. The average number of barges per tow was 10.1 through the LaGrange Lock. These tows would stretch about 460 miles, or approximately from Minneapolis-St. Paul to below Lock and Dam 18 near Burlington, Iowa. About 350,000 rail cars would line up for approximately 10,000 miles, or coast to coast more than 3 times. About 1.4 million semi-trailer trucks would be needed and would stretch over a distance of approximately 55,000 miles or about 2 times around the world. (Note: an average tow is 105 feet wide and 1,100 feet long - a 3 X 5 configuration)

The majority of the commodities found on the Upper Mississippi River System are Farm related products. The low transportation cost navigation system for bulk farm goods helps make U.S. farm products competitive in world markets.

Since 1970 total tons on the River have more than doubled. This is also true for Food and Farm Products. Between

1970 and 1980, there was a 59-percent increase in total tons. Between 1980 and 1990 there was a 19-percent increase and between 1990 and 1995 there was a 7-percent increase. The total tons and the tons related to agricultural uses can be found in table 1.

Table 1
Total Food and Farm Products
Minnesota to the Mouth of the Ohio River
(Thousands of Tons)

Year	Total Tons	Food and Farm	Agri-Chemical (fertilizer)
1970	58,445	20,756	2,144
1980	92,968	51,657	2,962
1990	110,309	57,480	4,067
1995	118,326	56,001	4,671

Source: Waterborne Commerce of the United States, Department of the Army, Corps of Engineers, Water Resources Support Center, WRSC-WCRS-XX-2.

Future Operation and Maintenance Needs

The locks and dams of the Upper Mississippi and Illinois Rivers on average are over 60 years old; that is more than 10 years over their expected useful life. A failure at a lock or dam could require weeks, months, or longer to repair. This would not only have local economic impacts to agriculture, but nation-wide impacts as well. This is why infrastructure rehabilitation of the locks and dams is very important. Major rehabilitation is in progress at three locks and dams in the St. Louis District as you will see in the following examples.

In the St. Louis vicinity at Locks 27 we have completed the main and auxiliary lock portions for new miter gate machinery. The new machinery provides a state-of-the-art hydraulic system for opening and closing the miter gates. Also the electrical system was totally updated as part of a continued operation and maintenance effort.

At Lock and Dam 25 we are just completing a lock de-watering system under a contract for \$3 million. A contract for rehabilitation of the mechanical and electrical systems at both lock and dams 24 and 25 is scheduled at a cost estimated to be approximately 12.5 million. There are very evident signs of deterioration at lock and dam 25. These problems must be addressed under the major rehabilitation program.

At Lock and Dam 24, there are very evident signs of concrete deterioration. The cost of the ongoing rehabilitation will exceed 60 million and require 5-7 years to complete depending on resources. Also at Lock and Dam 24 a contract is underway to repair bridge columns. In the near future dollars will be spent to replace major mechanical and electrical components, fabricate new lock miter gates, alter miter gate recesses, and construct a downstream protection cell. Another problem we are faced with at Lock and Dam 24 is evidence of cracking damage on the dam piers. The cause of this cracking is believed to be vibration of tainter gates during low water conditions and ice passing during extremely cold winters. These problems will be studied and repaired during a major rehabilitation effort.

Current Studies

Currently there is a study underway which is addressing the future infrastructure needs of the navigation system. As part of the Upper Mississippi River - Illinois Waterway Navigation Study we are currently investigating, along with the Rock Island and St. Paul Districts, the condition of all locks and dams on the Upper Mississippi River. The study will lead to a plan indicating the infrastructure investment required for the next 50 years for the navigation

system to continue to function. The study area comprises of all the Illinois Waterway plus that segment of the Mississippi river from the confluence with the Ohio River to Upper St. Anthony Falls Lock in Minneapolis-St. Paul, Minnesota.

This study is examining the feasibility of navigation improvements to these waterways to address the problem of delays to commercial navigation traffic. The feasibility study effort is considering small-scale and large-scale improvements to the river system over a 50-year period (2000-2050). Small-scale measures are less costly items such as guide-wall extensions or nonstructural measures such as scheduling programs or tolls. Large-scale measures are new 1200-foot locks or extension of existing 600-foot locks to the 1200-foot length.

Various disciplines are involved in providing engineering, economic, environmental, and public involvement input to develop existing, future without-project, and future with-project conditions. In addition to the no action alternative, the small-scale and large-scale measures will be combined into various alternative plans for evaluation and ultimately selecting a recommended plan. In addition to the working groups and to aid in the effort, coordinating committees have been established. The Governor's Liaison Committee consists of the Governor's designated representatives of the states involved and the Commander of the Mississippi River Division, U.S. Army Corps of Engineers. In addition to the Governor's Liaison committee, committees were established to aid the technical work groups and to garner external input and to review the technical aspects of the navigation study to help ensure development of a satisfactory product.

Conclusion

There is a need to maintain the inland waterways for future use. The U.S. Army Corps of Engineers has recognized this need and is making efforts to maintain this system. Through the major rehabilitation program, there will be continued investment into the rehabilitation and replacement of system components. As a compliment to this program, the Upper Mississippi River - Illinois Waterway System Navigation Study will look at infrastructure needs for the next 50-years. Much effort must be made to continue to provide services for agricultural shippers and all users of the system.